BOOK REVIEWS

Applied Physics. By V. D. HAWKINS. New York: Longmans, Green & Co., 1912. Pp. ix+199.

A comprehensive book, one in which the author has kept aloof from the erg, dyne, and other terms which do not particularly help the "average" high-school pupil and coupled the book and student to the common, everyday phenomena of life. It is a book in which one will become interested because he is brought in touch, quickly, with those fundamental principles of physics which have already arrested his attention. The author does not claim to have covered all the physics ground in this text, but has left to the live, well-informed instructor that interesting and helpful phase of the subject, the illustrative experiment.

Physical Laboratory Guide. By FREDERICK C. REEVE. New York: American Book Co., 1913. Pp. x+182. $0.60.

In this guide there are twelve chapters, nine being devoted to a very complete discussion of the sixty-six experiments, the other three containing notes on the experiments and having a very complete list of physical constants used in the book; the experiments are well selected and cover the requirements for entrance to college. The directions for performing each experiment are clear and complete, thus economizing the time of both teacher and pupil. A most valuable feature is the scattering of many questions throughout the book, the answering of which will help fix in the pupil's mind the principles brought out in the experiments. The book can be used with any good physics text. There are but sixteen drawings; more would have been helpful to the pupil. The composition and press work are excellent and the mechanical work equally good.

New Analytic Geometry. By PERCY F. SMITH and ARTHUR S. GALE. Boston: Ginn & Co., 1912. Pp. x+342. $1.50.

Higher Algebra. By HERBERT E. HAWKES. Boston: Ginn & Co., 1913. Pp. v+222. $1.40.

Elementary Plane Geometry. By JOHN C. STONE and JAMES F. MILLIS. Boston: Benj. H. Sanborn & Co., 1910. Pp. ix+252. $0.75.

Though the *New Analytic Geometry* is planned to provide an adequate drill in the use of co-ordinates and in the employment of analytic methods, it meets in many respects the requirements for a good practical course. The

five forms of the equation of the straight line are derived in a way to be easily grasped by the student, and there is an abundance of problems for drill.   However, it is a simple matter to show the students that only one form, $y=mx+b$, is really needed to solve all the problems.   It seems a waste of time to plot many curves of the second degree by locating points, when the curves can be readily sketched after their properties have been studied.

The chapters on transcendental curves and equations, polar co-ordinates, and parametric equations and loci are of considerable value for reference, and as far as time permits in a short course they furnish good material for work. It is so difficult to find practical problems having a real connection with analytic geometry that the chapter on functions and graphs is very welcome.   These problems, moreover, serve as an excellent introduction to the calculus.   There is no trouble in having students find tangents to curves by the $\dfrac{dy}{dx}$ method, and immediately make application in finding maximum and minimum values.

The derivation of the equations of the conic sections by using a separate definition for each curve is undoubtedly the easiest for the student; and in following this plan and giving an excellent discussion of the properties of the curves and in giving the methods of mechanical construction the authors are to be commended.

Solid analytic geometry occupies eighty-seven pages, and the presentation is adequate for use in the calculus.   The chapter on empirical equations at the close of the book should not be overlooked by an instructor.   This subject is just beginning to receive the attention it deserves.

The *Higher Algebra* covers the ground of the usual course in college algebra, and is amply sufficient for future work in engineering and science.   An introductory review prepares for the work that follows.   The second chapter, Functions and Graphs, treats the subject in a very practical way and furnishes the basis for considerable graphical work in the later chapters.   The quadratic equation is treated with considerable thoroughness, and complex numbers are given a more extensive discussion than most textbooks accord them.

The treatment of the theory of equations is noteworthy because of the omission of unimportant details, the clear presentation of the essential principles, and the use of graphical methods.   Instead of a long chapter on undetermined coefficients the one important topic, partial fractions, is given.   It is doubtful if the average student knows much about infinite series after a study of the subject; but it would seem possible for him to get a fairly good grasp of the subject from this book.   The explanations and illustrations are clear and convincing, and only the simplest cases are considered.   This textbook will, no doubt, have a wide use in colleges and technical schools.

The Stone-Millis *Plane Geometry* is one of the best geometry texts of recent years.   For the most part complete proofs are not given, but enough suggestions are made to enable the pupil to complete the proof for himself.   This gives ample drill in solving original exercises and leaves much time for the

applied problems. Teachers who desire the traditional original exercises will find plenty of them, but of greater value are the many simple problems of geometry that have been gathered from the various practical fields of daily life. These applied problems awaken the interest of the pupils in the study of geometry, and supply the motive for effective study.

In the early pages formal demonstrations are not attempted but a concrete basis is first obtained through measurements, constructions, and the like. These drawings and constructions are made not alone with the Euclidean ruler and compasses; the pupils learn to use the protractor and triangle as in practical work. Quite a number of geometrical exercises are given for algebraic solution, in order to keep alive the pupils' knowledge of algebra; and as an application of similar triangles, angle functions are introduced and used to compute heights and distances. In many ways this book meets the present-day demands for methods of instruction which will prepare pupils for their work after leaving school.

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A Laboratory Manual for Physical and Commercial Geography. By R. S. TARR and O. D. VON ENGELN. New York: Macmillan, 1913. Pp. vii+214. $0.25.

A Guide for Laboratory Geography Teaching. By O. D. VON ENGELN. New York: Macmillan, 1913. Pp. iii+20.

These publications are auxiliary to the *New Physical Geography* recently published by Professor Tarr. They are designed to encourage and make possible the use of the laboratory method in the study of geography in normal schools and colleges. The *Guide* is for the use of teachers, explaining questions arising in the use of the *Manual.* The *Manual* contains fifty-six exercises covering a large range of geographical topics grouped under six heads: the world as a whole, in which instruction is given in map-making; minerals, rocks, and soil; the making and interpretation of topographic maps; the geography of the lands; the ocean; and the atmosphere. The apparatus required for these exercises is carefully described, and is comparatively simple. The cost is estimated as between a minimum of $40 and a maximum of $115 for a class of ten students. There is no doubt as to the skill with which the exercises have been arranged, and the comprehensive understanding of the subject upon which they are based. It is probable that the individual experience of the authors has given them their shape, and that other teachers might find themselves somewhat cramped by the mass of suggestion and the rigidity of the form, but it is not probable that at the present time many people in the country have worked out a system by any means as comprehensive, and doubtless these publications will do much to call attention to the possibilities of laboratory